



# **Armed Forces College of Medicine**

## **AFCM**



# **Posterior compartment of leg**

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Mohamed**

# INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture the student will be able to:

1. Define attachment and structures passing behind flexor retinaculum
2. Describe the attachment, action and nerve supply of muscles of back leg; superficial and deep
3. Describe root value origin, course and branches of posterior tibial nerve
4. State beginning, course and branches of posterior tibial artery

# Lecture Plan

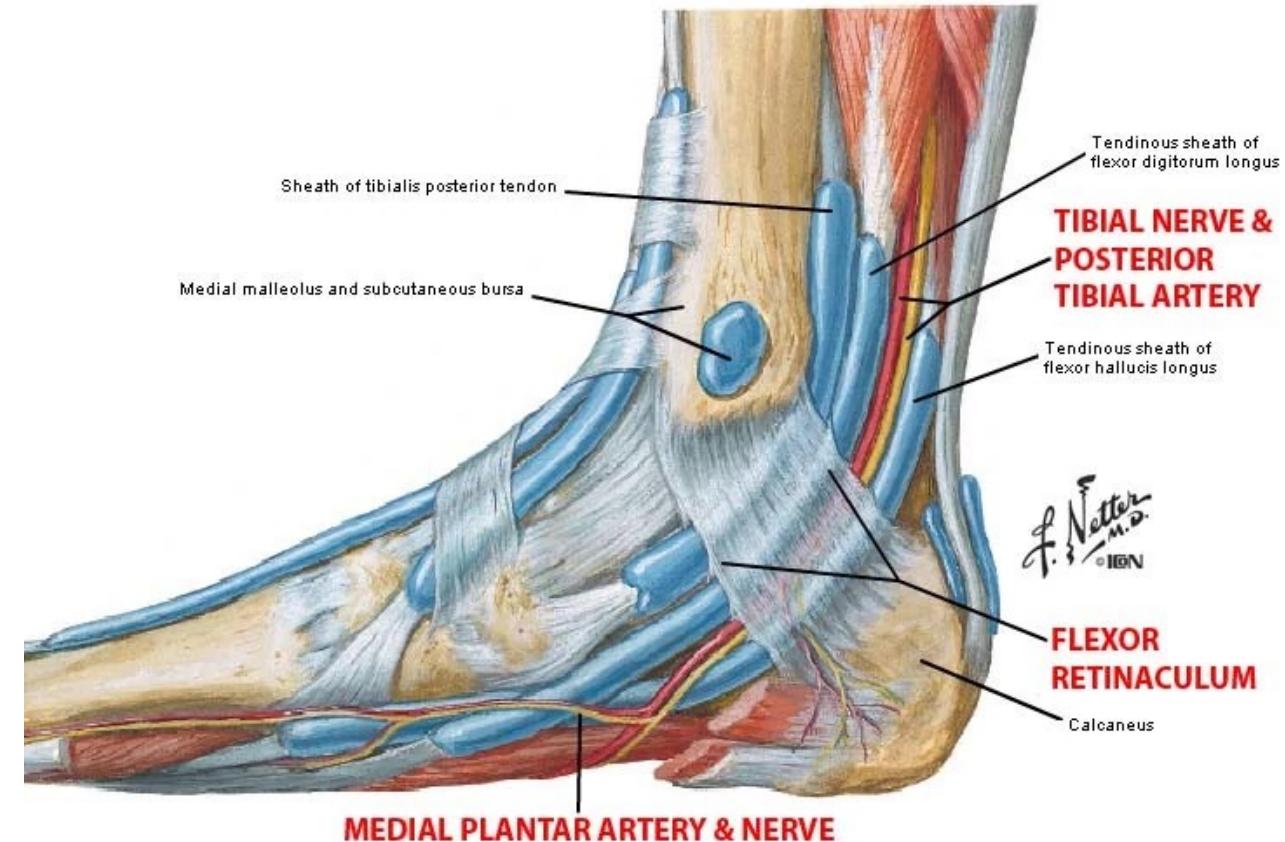


1. Part 1 posterior compartment
2. Muscles , nerves and vessels of posterior compartment
3. Part 3 Summary
4. Lecture Quiz

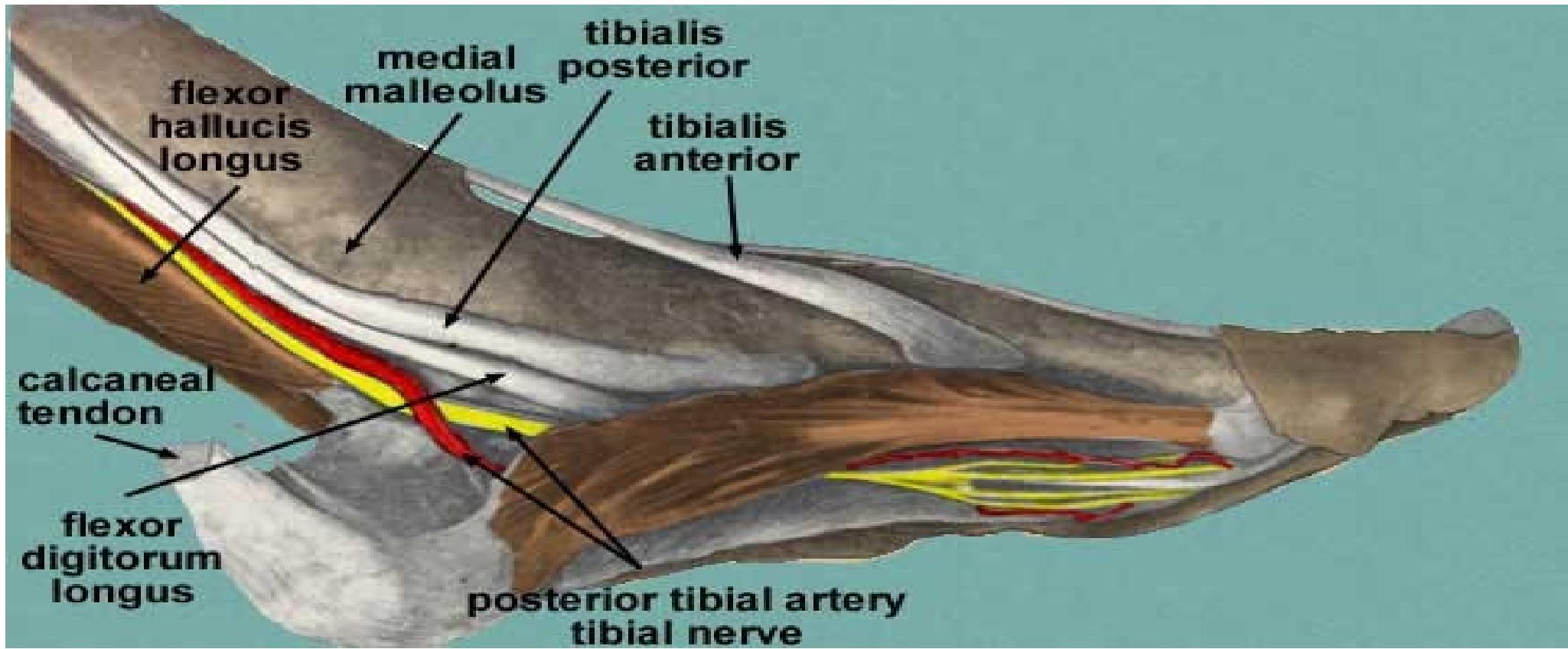
# Flexor retinaculum



- ❖ It is on the **medial side** of the ankle behind the **medial malleolus** .
- ❖ Ant . attached to the posterior border of the **medial malleolus**
- ❖ Post. attached to the medial process of the **calcanean tuberosity** and is cont. with the **planter aponeurosis**.



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***Tom does very nice hats***



**MUSCLES OF  
THE BACK ARE  
ARRANGED  
INTO 2 GROUPS**

## ***SUPERFICIAL***

- Gastrocnemius
- Soleus
- New Five Year Program  
plantaris

## ***Deep***

- Popliteus
- Flexor digitorum longus
- Flexor hallucis longus



# Posterior compartment

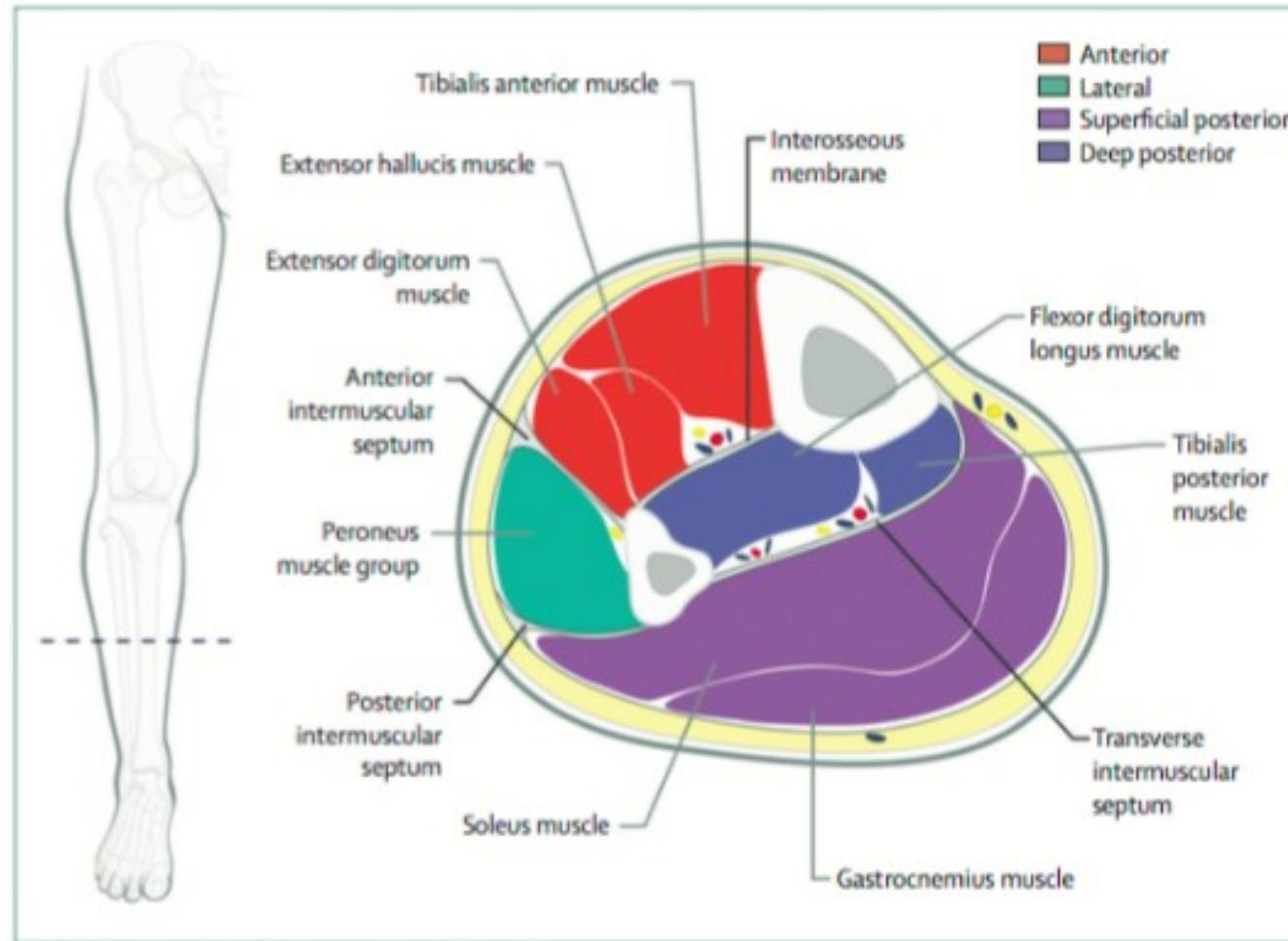


Figure 3: Cross-sectional anatomy of the calf

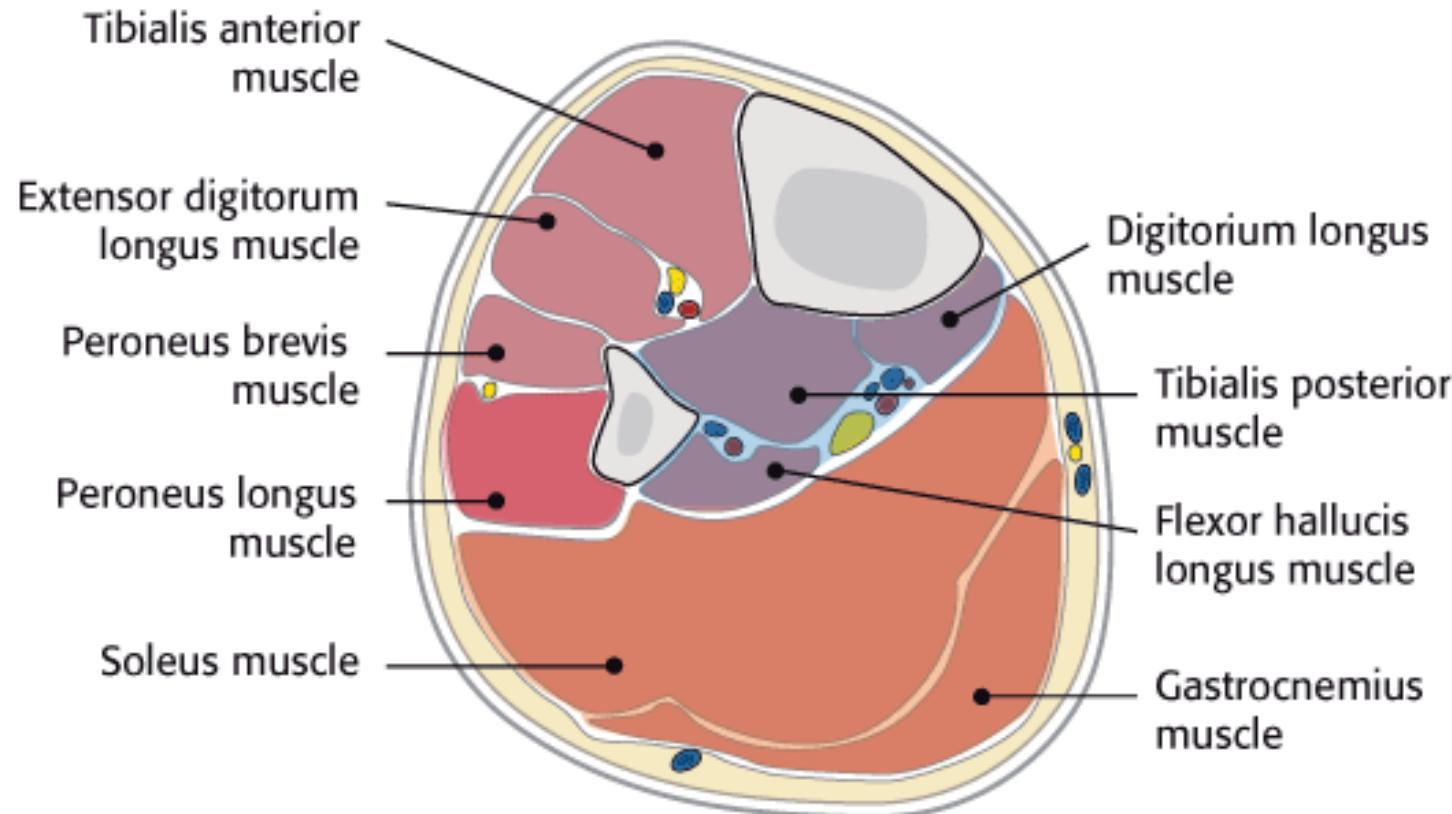
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# Divisions of posterior compartment



- First septum lies between superficial and deep muscles
- Second septum separates deep group into an area for flexor hallicus longus and flexor digitorum and posterior tibial vessels and tibial nerve and area for tibialis posterior

# Posterior compartment

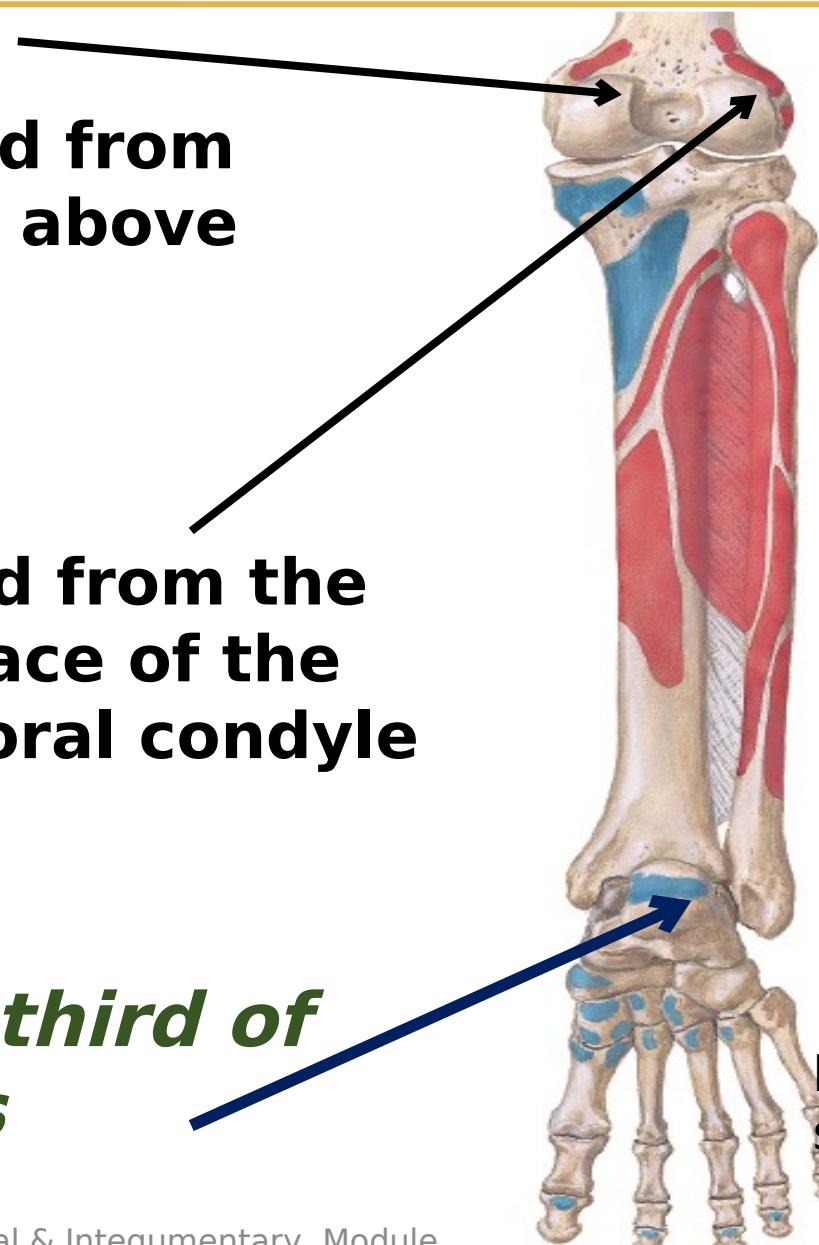


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# Gastrocnemius



- **Medial head from rough area above medial epicondyle**
- **Lateral head from the lateral surface of the lateral femoral condyle**

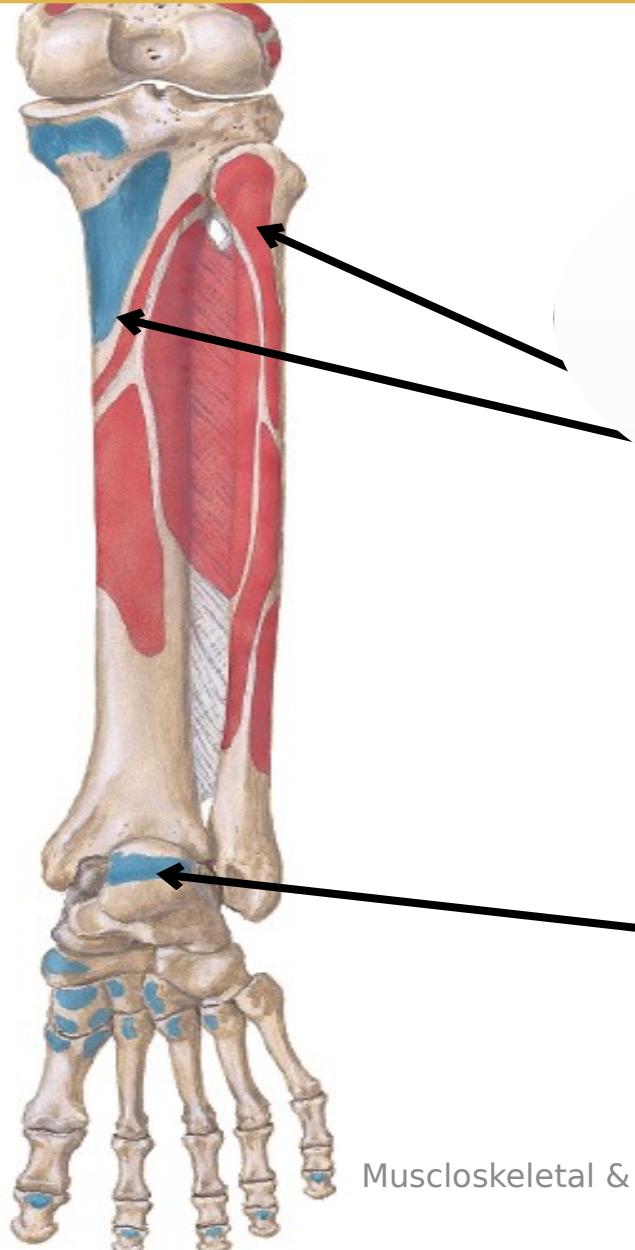


➤ *Middle third of calcaneus*

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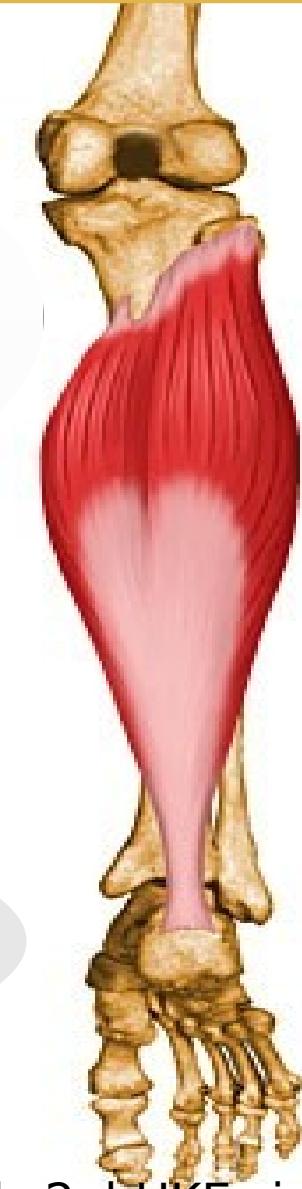


# Soleus



**Origin**  
**From the back of head of fibula**  
**Upper  $\frac{1}{4}$  of post.surface of fibula**  
**Soleal line**  
**Middle  $\frac{1}{4}$  of medial border of tibia**

**Insertion**  
**Midddle  $\frac{1}{3}$  of back of calcaneus**



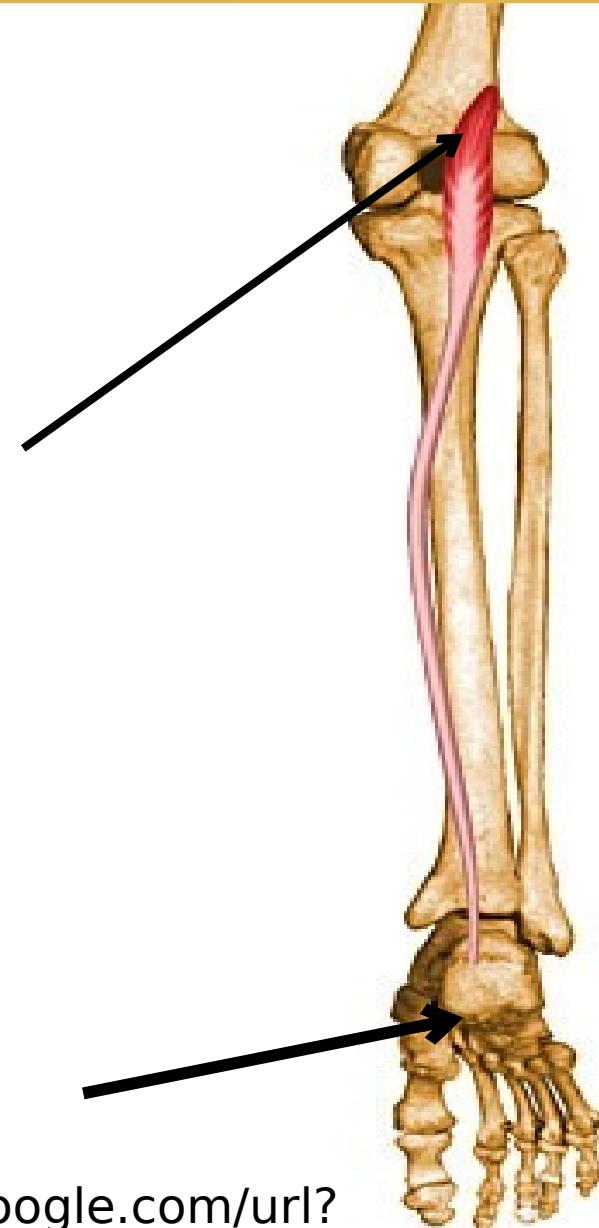
# Plantaris



## Origin

From lower part of  
lateral supracondylar  
line

Insertion  
With the tendocalcaneus

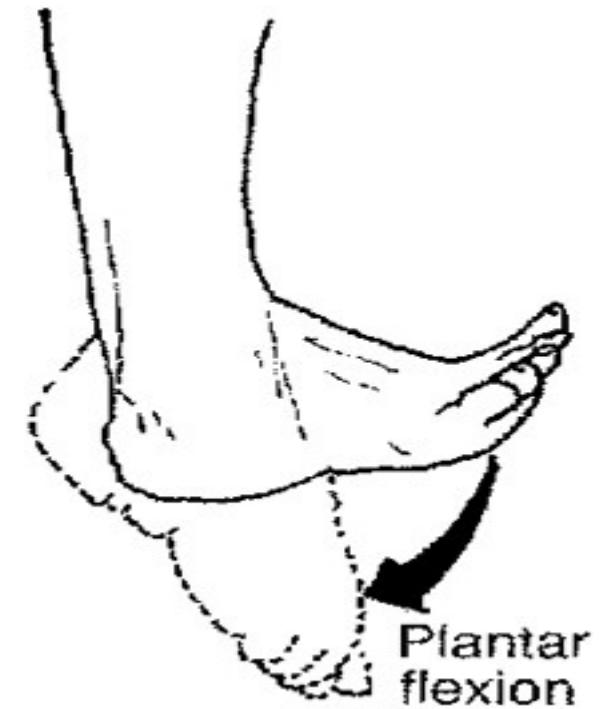


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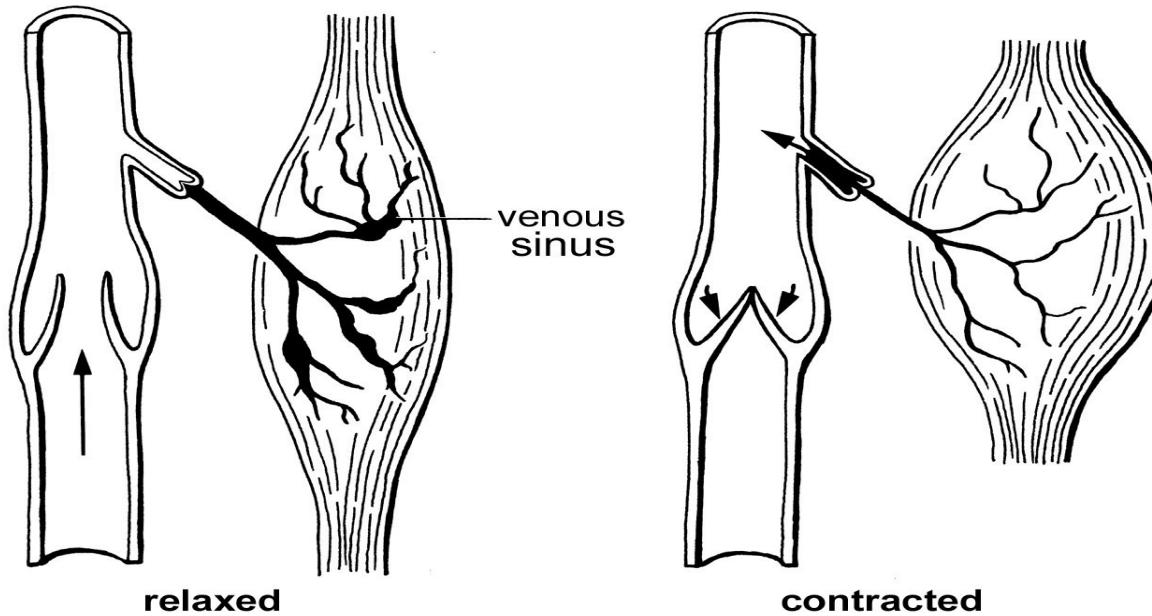
# Action of muscles



- The superficial muscles of the calf are strong **planter flexors**
- **Stabilize** leg on foot in standing
- **Gastrocnemius and plantaris are flexors of knee**
- Help in **venous** return



# Action of muscles



Venous sinuses: effect of contraction of calf muscle

Contraction of calf muscles plays an important role in **venous return** from lower limb

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# Action of muscles



Supracondylar fracture of the femur the popliteal artery may be injured by lower fragment of bone which is pulled by gastrocnemius

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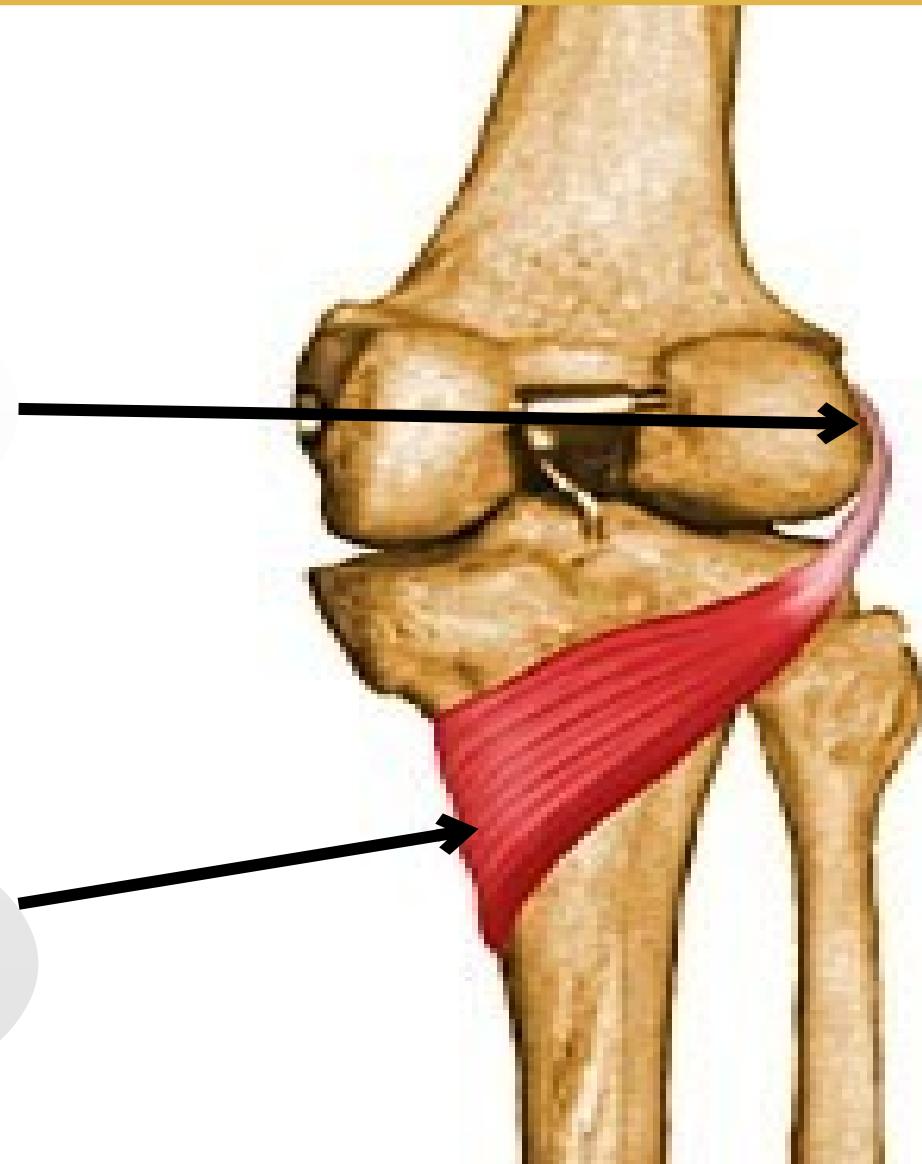
# Popliteus



## *Origin*

**Anterior end of  
popliteal groove  
On the lateral surface  
of lateral femoral  
condyle**

**Insertion**  
**Posterior surface of  
tibia above soleal line**



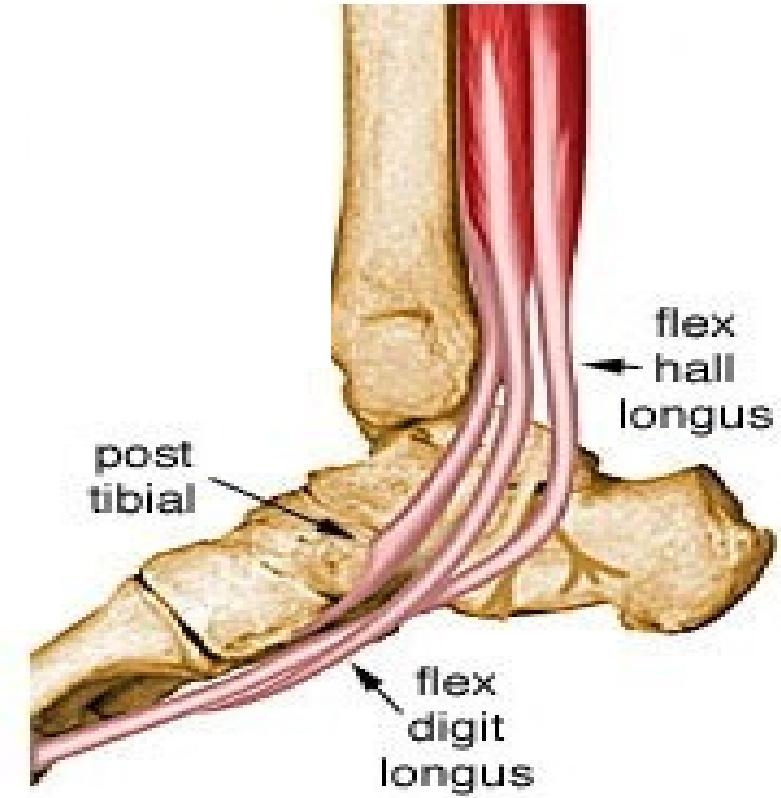
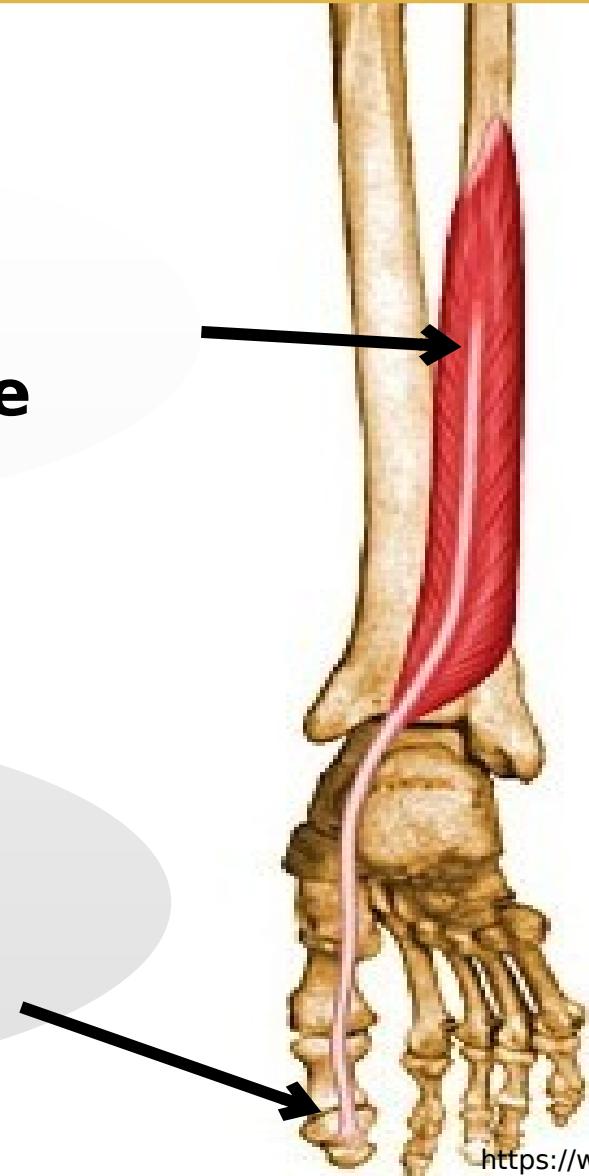
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# Flexor hallucis longus



**Origin**  
From the  
posterior surface  
of fibula

**Insertion**  
Distal phalanx of  
big toe



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# Flexor digitorum longus

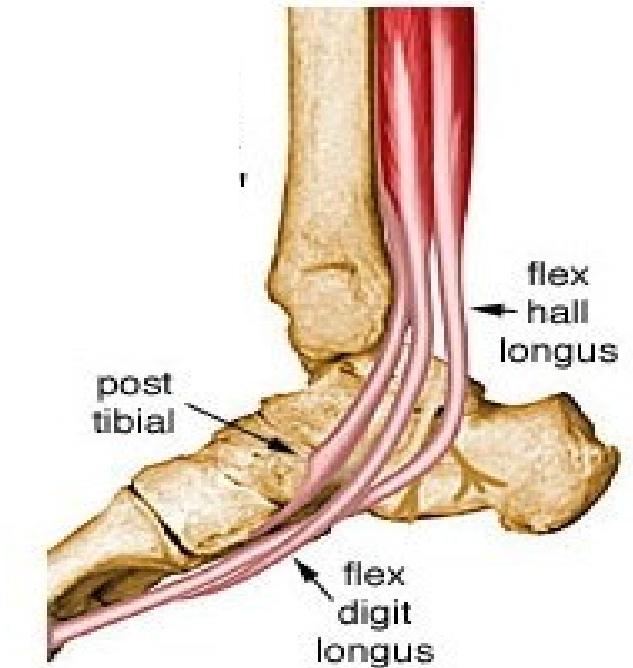
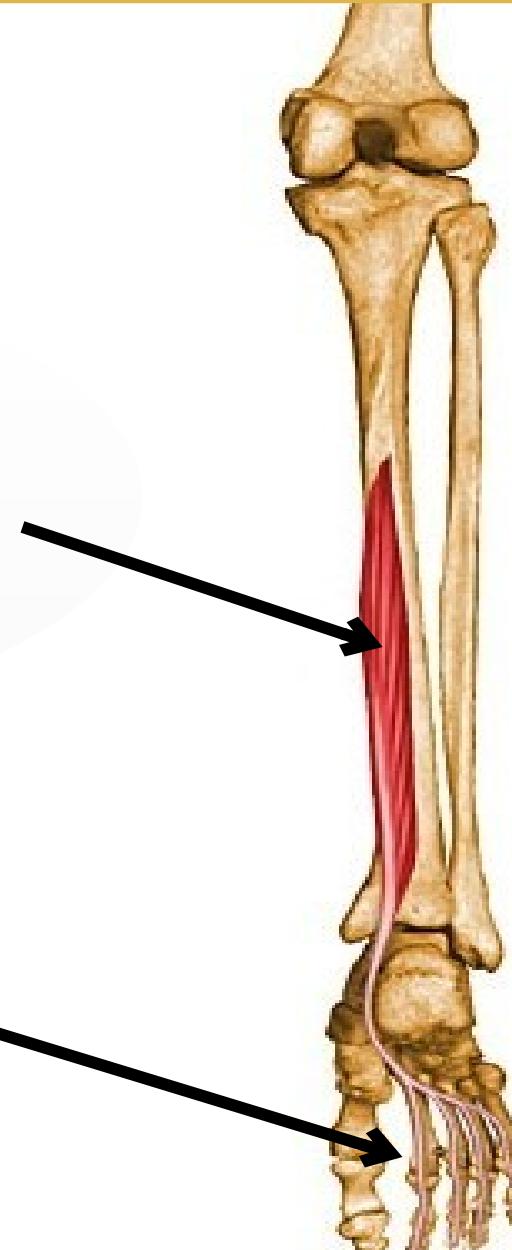


## Origin

From the posterior surface of tibia below soleal line medial to the vertical line

## Insertion

Distal phalanx of the lateral 4 toes

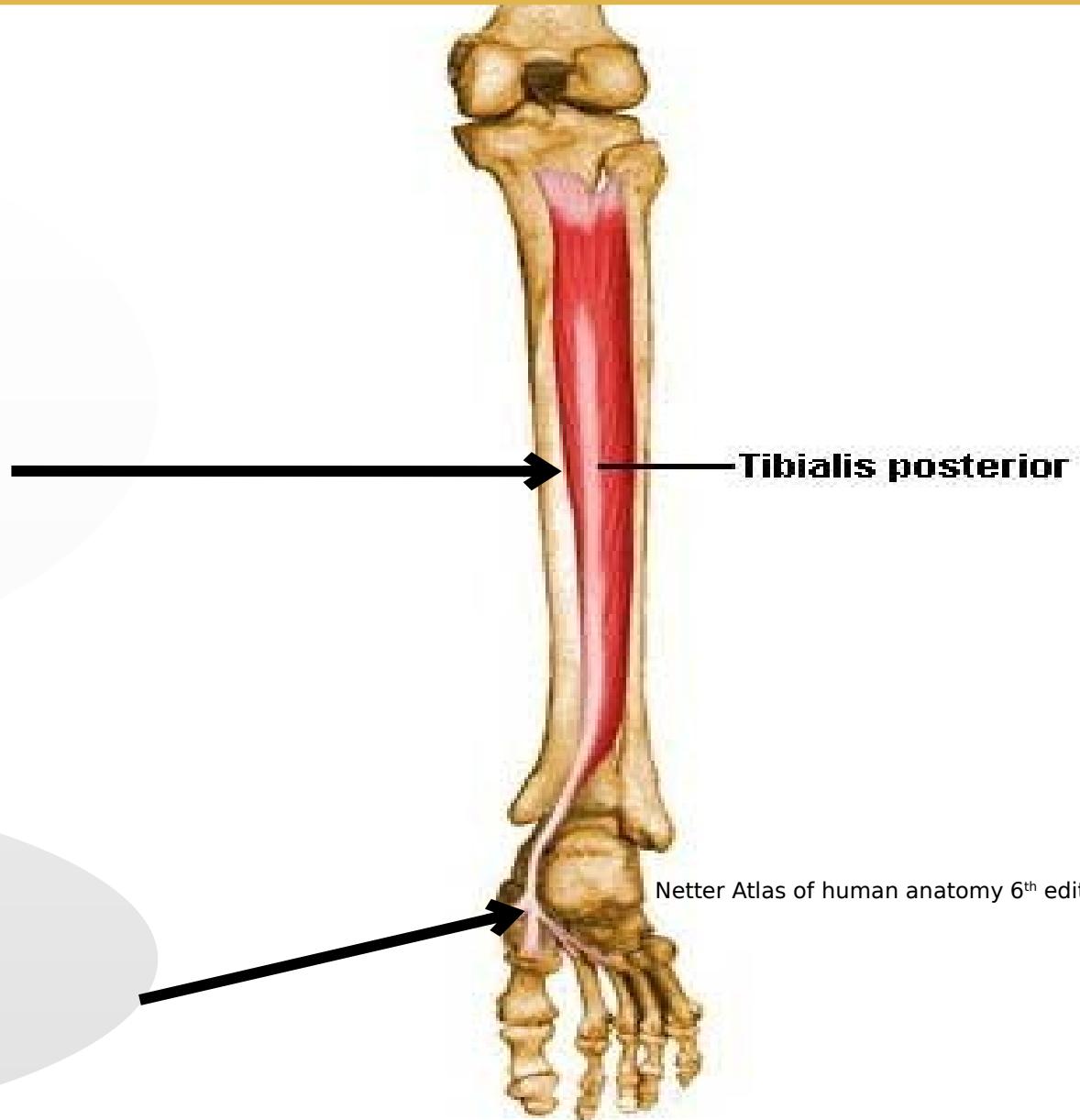


# Tibialis posterior



## Origin

**From the posterior surface of tibia below soleal line lateral to the vertical line + posterior surface of fibula**



Netter Atlas of human anatomy 6<sup>th</sup> edition

**Insertion**  
**To all tarsal bone( except talus) & middle 3 metatarsal**

# Nerve supply of muscles of back of leg



All the muscles are supplied by **Tibial nerve**



## Action of popliteus

- Flex knee
- During initial flexion with foot on ground it produces lateral rotation of femur on tibia UNLOCKING the knee when leg is free it produces medial rotation of tibia on femur
- Prevent crush of lateral meniscus between femoral condyles by pulling it backwards



## Action of flexor digitorum longus

- **Flexion of metatarsophalangeal joints and interphalangeal joints of lateral 4 toes**
- assist in planter flexion
- Support longitudinal arch
- Maintain the toes in firm contact with the ground

# Action of flexor hallucis longus



- Flexion of joints of big toe
- Assists in planter flexion of foot
- Supports medial longitudinal arch

# Action of Tibialis posterior

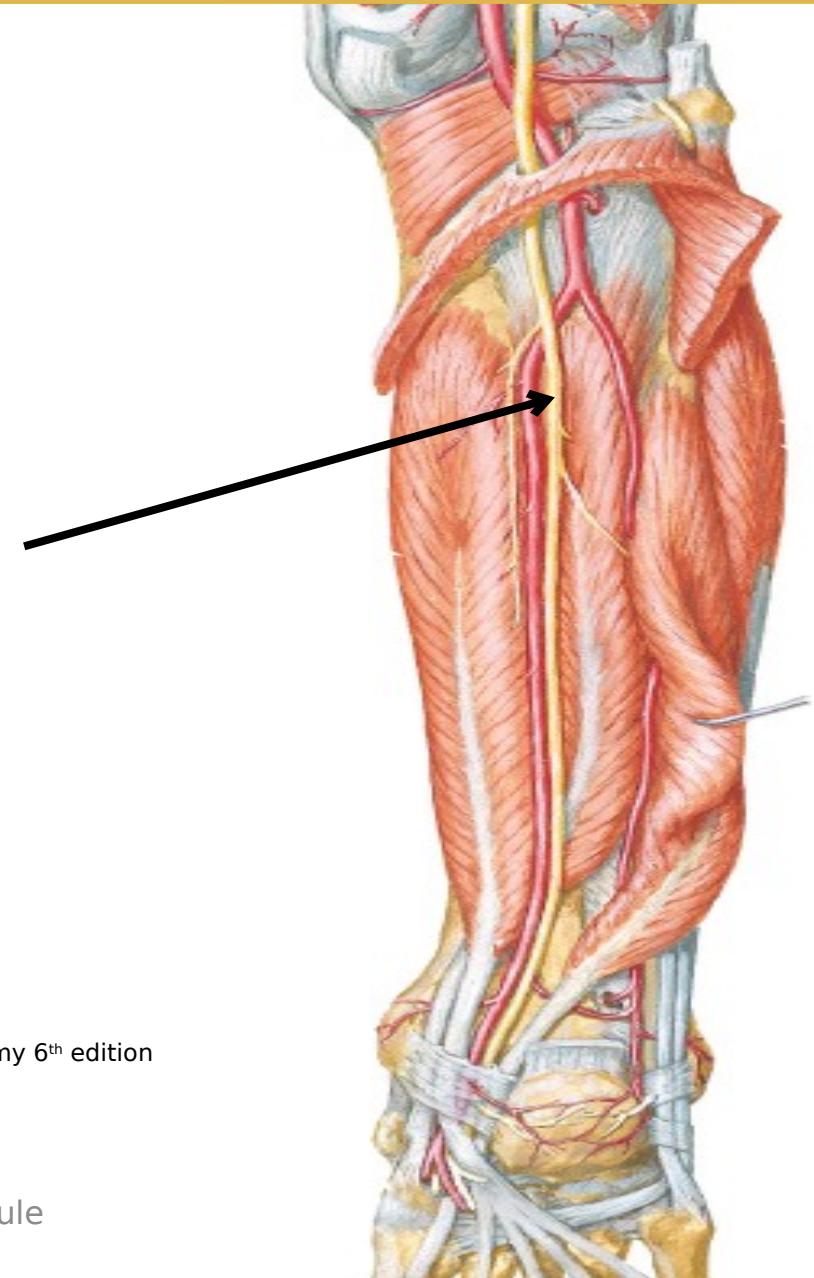


- Strong invertor
- Planter flexion
- Supports medial longitudinal arch
- Supports transverse arch

# Tibial nerve



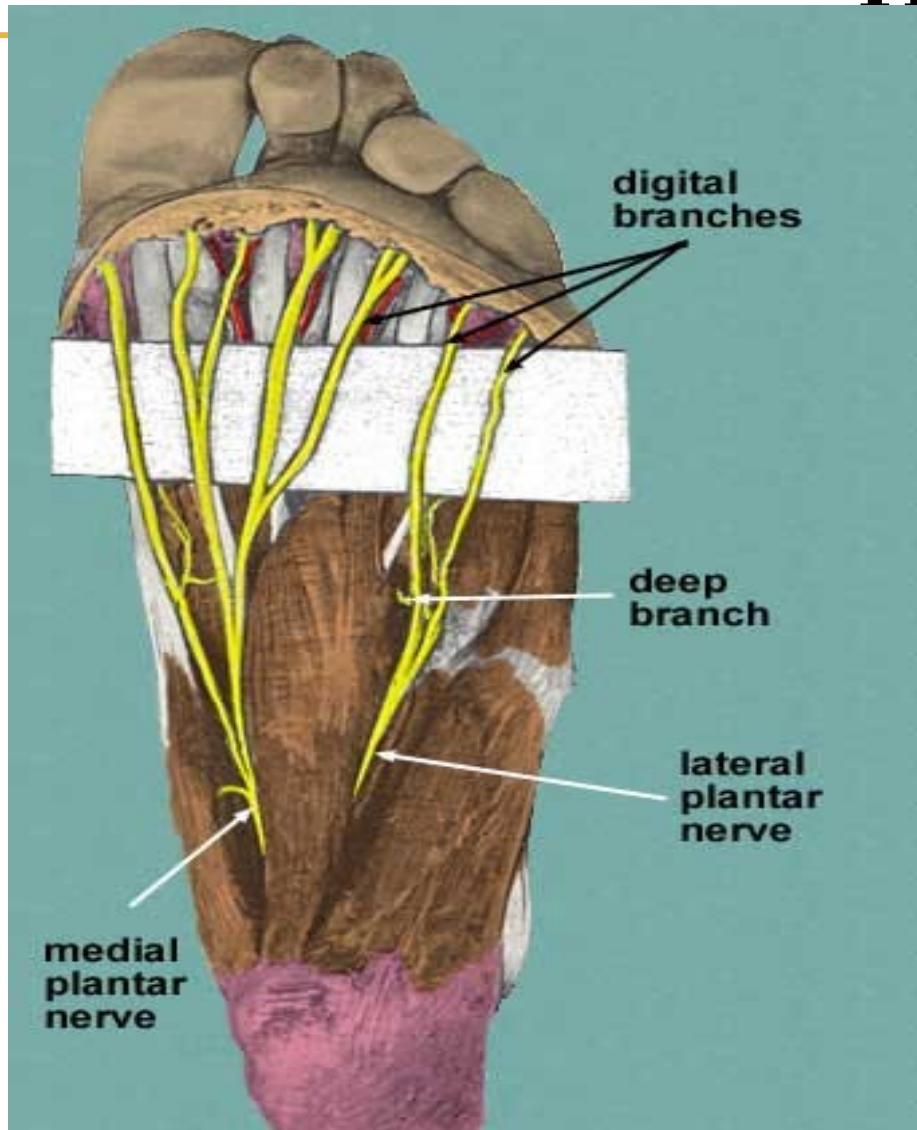
- ❖ It enters **the back of the leg from the popliteal fossa at the distal order of popliteus**
- ❖ It passes **deep to the soleus muscle between the tibia and fibula** .
- ❖ It supplies all the **muscles of the posterior compartment**.
- ❖ It ends **deep to the flexor retinaculum by dividing into medial and lateral planter nerves**.



Netter Atlas of human anatomy 6<sup>th</sup> edition

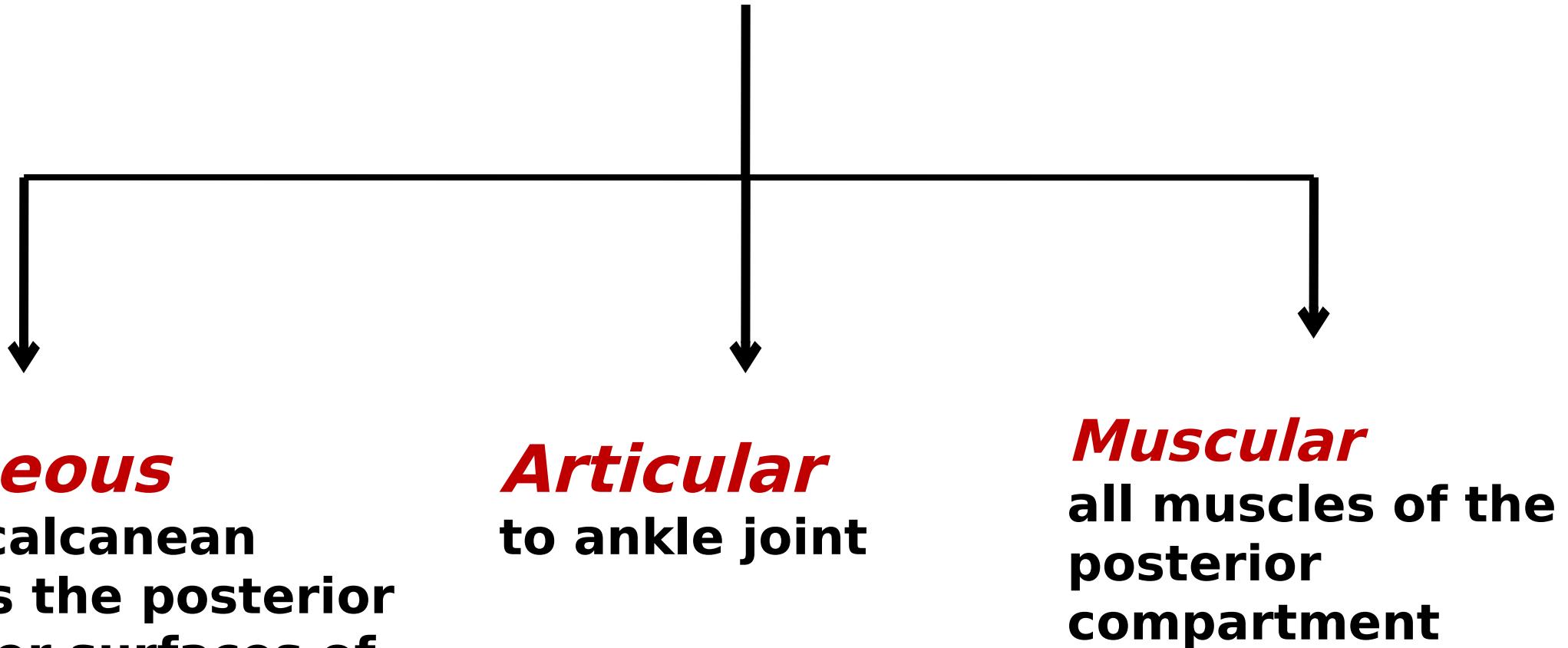


# Tibial nerve



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# Branches of Tibial nerve



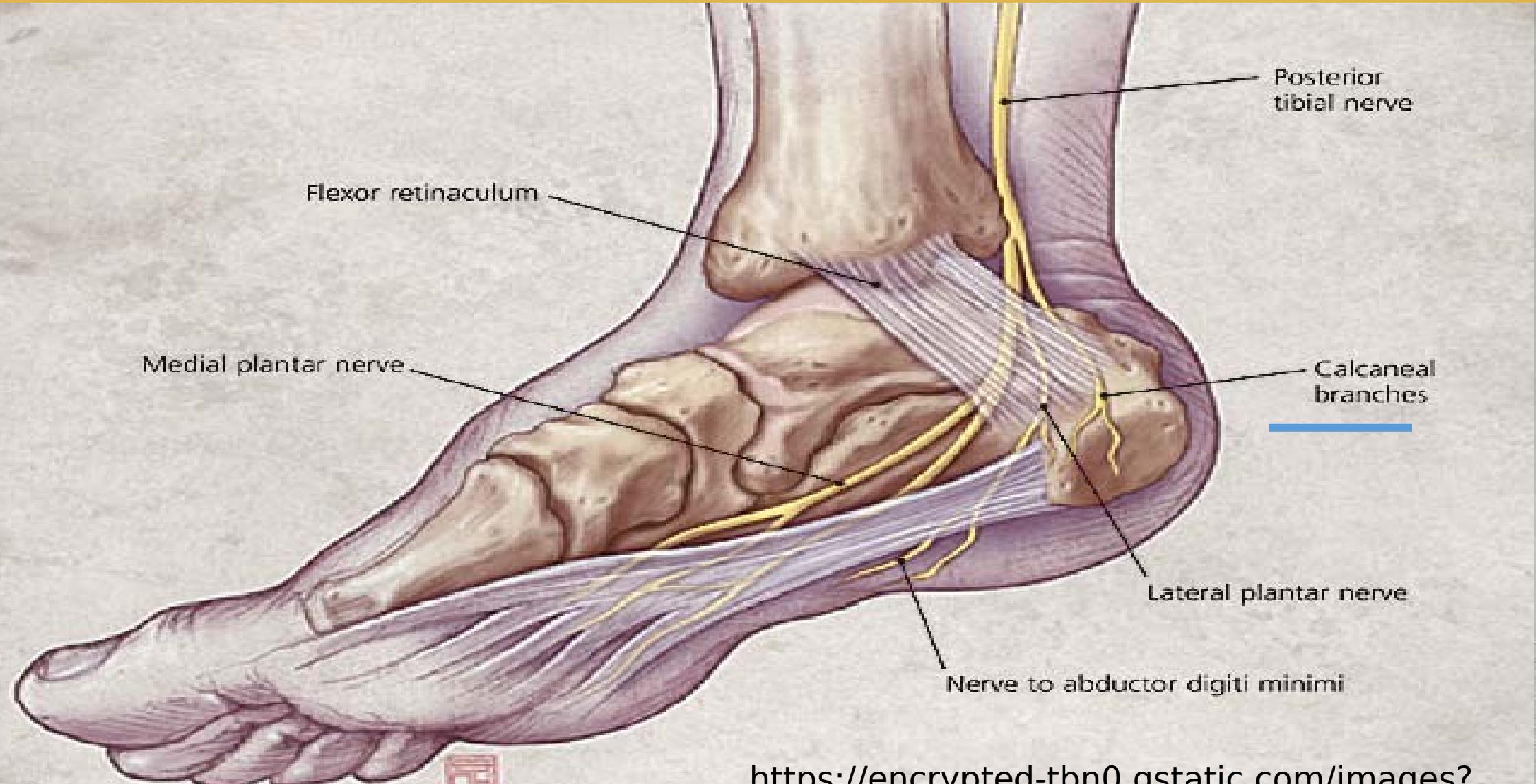
## ***Cutaneous***

Medial calcanean  
Supplies the posterior  
and lower surfaces of  
the heel and the  
medial side of the  
sole.

## ***Articular*** to ankle joint

## ***Muscular*** all muscles of the posterior compartment

# Branches of Tibial nerve

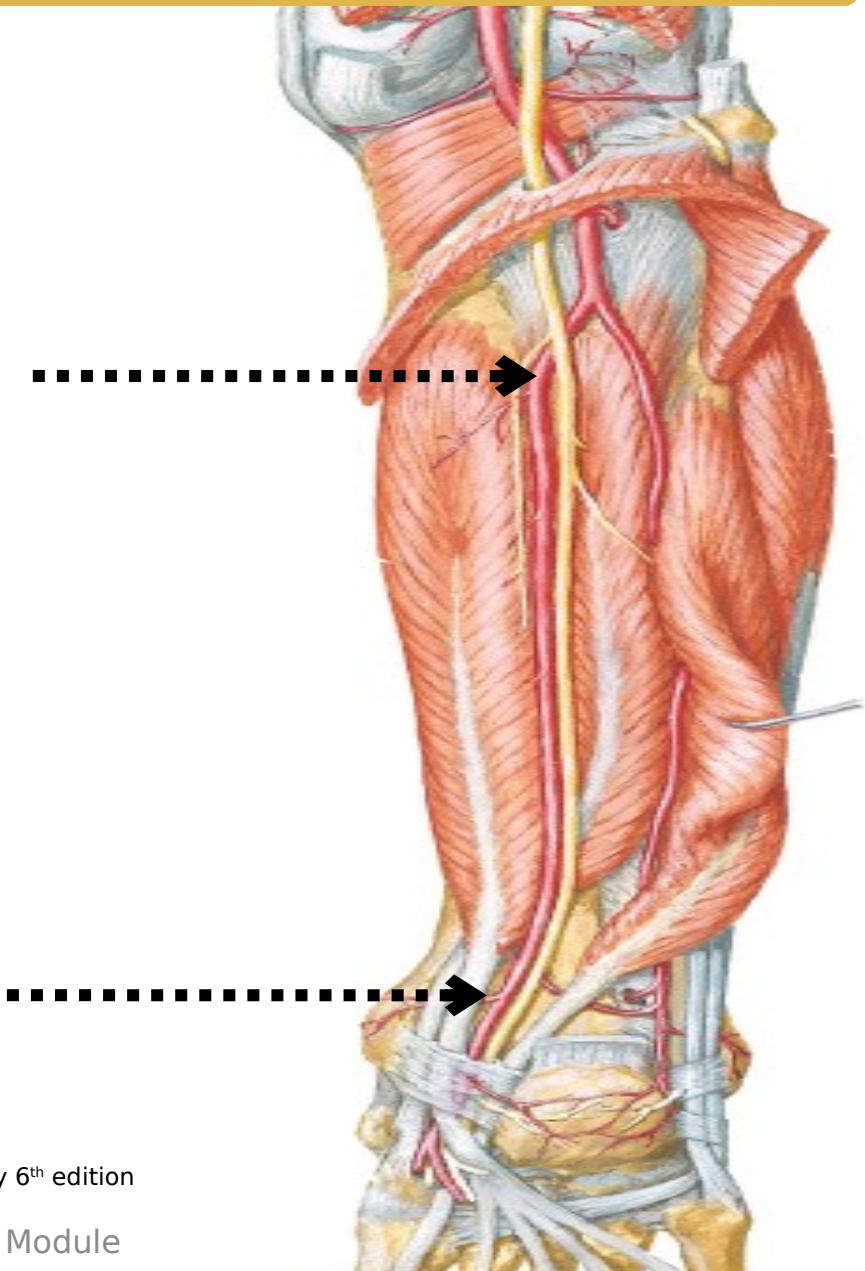


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# Posterior tibial artery



- ❖ It is the **larger** of the two terminal branches of the popliteal artery .
- ❖ It passes under the **soleus** between the **tibia** and **fibula** & descends in the posterior compartment
- ❖ It ends **deep** the **flexor retinaculum** by dividing into **medial & lateral planter arteries**.



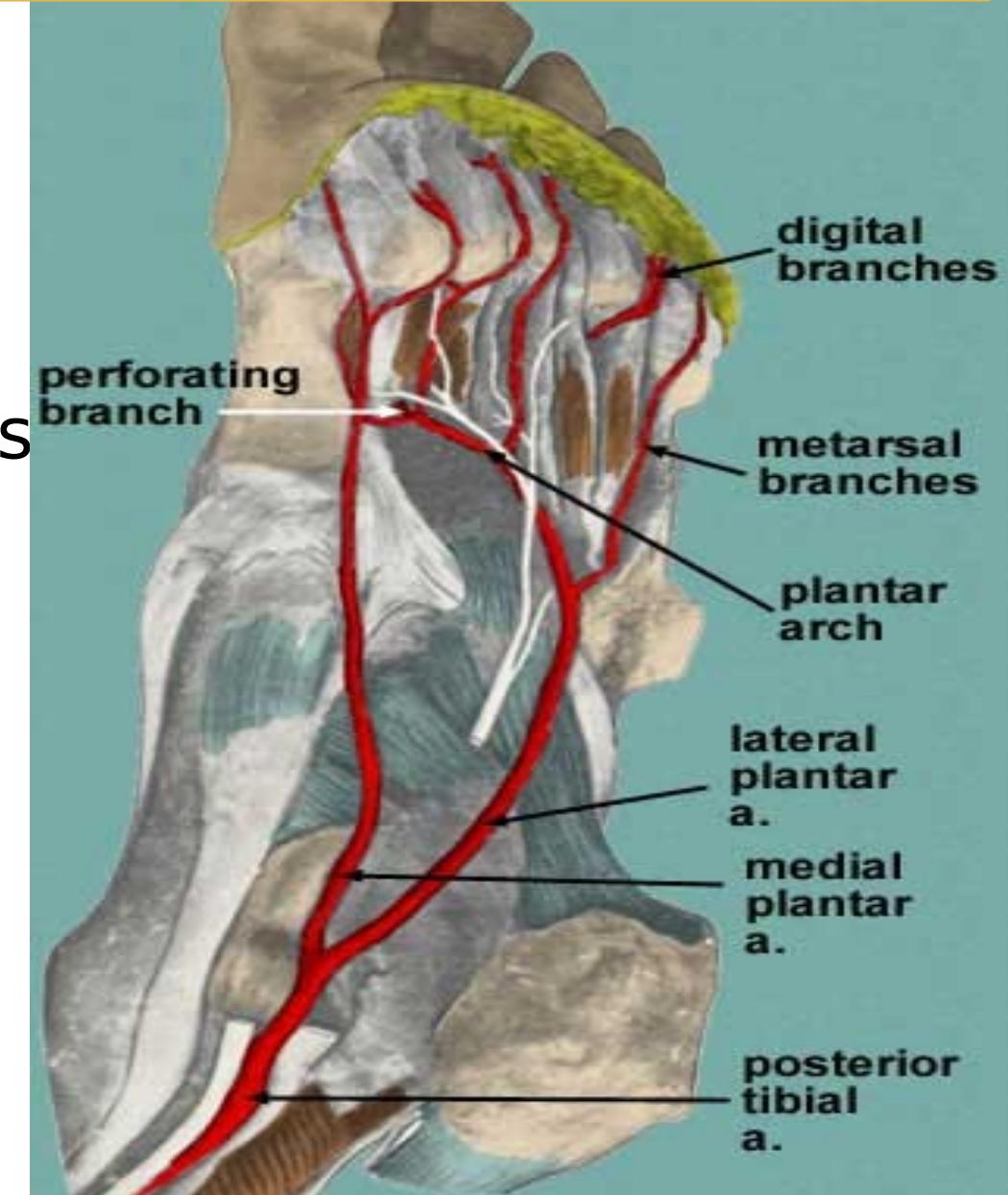
Netter Atlas of human anatomy 6<sup>th</sup> edition

Musculoskeletal & Integumentary Module

# Branches of posterior Tibial vessels



- ❖ **Muscular**
- ❖ **Nutrient** artery to the tibia
- ❖ **Communicating** branch which joins that of the peroneal artery.
- ❖ **Calcanean** branches
- ❖ **Medial malleolar** branch
- ❖ **Circumflex fibular** artery to knee joint .

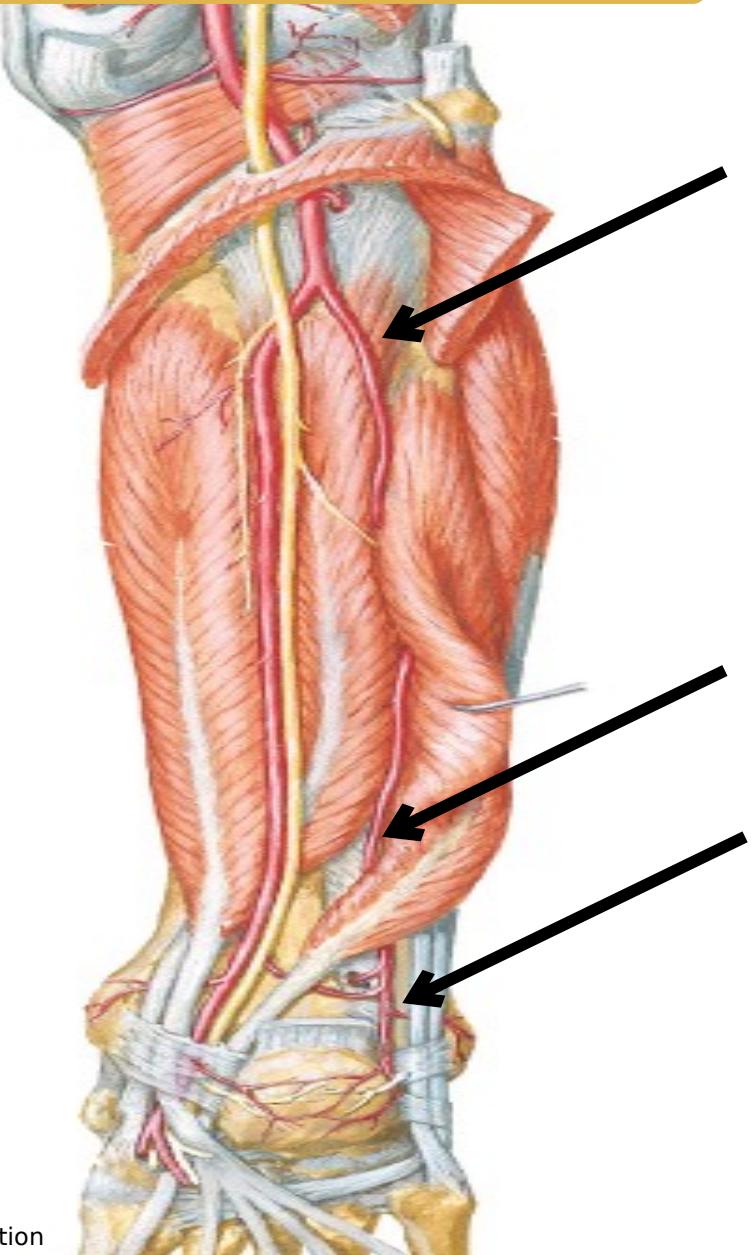


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# Peroneal artery



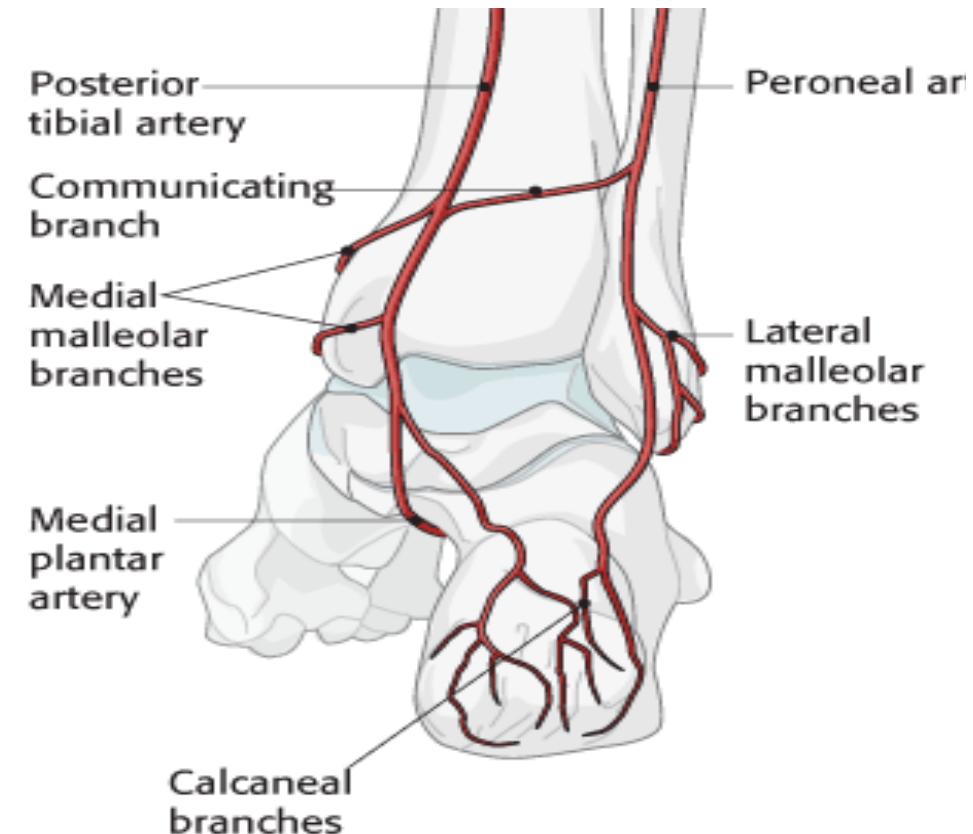
- ❖ It is the largest branch of post.tibial artery
- ❖ It descends along the **medial crest of the fibula**
- ❖ It terminates behind the **inferior tibiofibular joint** by giving **calcanean branches**.



# Branches of Peroneal artery



- ❖ **Muscular**
- ❖ **Nutrient** artery to the fibula
- ❖ **Communicating** branch which joins that of the post.tibial artery.
- ❖ **Calcanean** branches, join the calcanean br.of post.tibial artery .
- ❖ **Perforating branch** :it reaches the ant. compartment to anastomose around the lateral malleolus.



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# Lecture Quiz



Question 1 unlocking of knee is an action of which of the following muscles

- a) Plantaris
- b) Popliteus
- c) Tibialis posterior

Question 2

Enumerate branches of peroneal artery

Question 3

what are the two terminal branches of posterior tibial nerves

# SUGGESTED TEXTBOOKS



Clinical anatomy by regions 9<sup>th</sup> edition by Richard Snell



Thank you